ATTACHMENT 6
INSTRUMENT CALIBRATION PLAN
&
INCINERATOR WASTE FEED INTERLOCK FUNCTION TEST

Consisting of:

- Attachment 6 - Page 1 through Attachment 6 - Page 27, as last revised January 2003.

6.1 SCOPE

6.1.1 This calibration Plan:

- Describes the basis for assigning TAG ID's to the various instruments and alarms associated with components of the process control systems for tank and incinerator Hazardous Waste Management Units (HWMU).

- Identifies components of the process control system associated with incinerator HWMU requiring proper operation to ensure the proper waste treatment, to stop/prevent the feeding of hazardous waste to incinerators should the magnitude of permit regulated operating parameters exceed limits imposed by permit condition, and to demonstrate compliance with TOCDF Part B Permit conditions.

- Identifies components of the process control system associated with permitted tank HWMU requiring proper operation to determine accurate volumes of liquid wastes stored in tanks, to prevent the overtopping of tanks, and to demonstrate compliance with TOCDF Part B Permit conditions limiting the volume of hazardous waste stored in tanks.

- Differentiate between instrumentation calibrated by the user and instrumentation calibrated by the manufacturer.

- Differentiate between instrumentation that is calibrated and function tested, and instrumentation that is function tested only.

- Describe the methods used to verify operational accuracy (i.e., function test) and calibrate different types of process control instrumentation associated with the demonstration of compliance with TOCDF Part B Permit conditions.

- Describes the methods used to function test the waste feed interlock system associated with each incinerator and overtop protection system associated with each tank HWMU.

6.2 INSTRUMENT/ALARM TAG ID NOMENCLATURE

6.2.1 A unique TAG ID is used to identify each instrument and alarm. An instrument's TAG ID is stamped on a metal "tag" physically attached to (or in close proximity to) the instrument. Each instrument TAG ID is comprised of a 2 digit prefix "system identifier," followed by a 3-4 letter "instrument type identifier," followed by an 1-3 digit suffix "instrument number."

6.2.2 The 2-digit prefix "system identifier" and the corresponding systems are presented below:

SYSTEM IDENTIFIER	CORRESPONDING SYSTEM
11-XXX-XXX	Agent Collection System including: ACS-TANK-101 & ACS-TANK-102
11-XXX-XXX	Spent Decontamination System including: SDS-TANK-101, SDS-TANK-102, & SDS-TANK-103
13-XXX-XXX	Liquid Incinerator Systems (LIC 1, & LIC 2)
14-XXX-XXX	Metal Part Furnace System (MPF)
16-XXX-XXX	Deactivation Furnace System (DFS)
23-XXX-XXX	Brine Reduction Area System including: BRA-TANK-101, BRA-TANK-102, BRA-TANK-201, & BRA-TANK-202
24-XXX-XXX	Incinerator Pollution Abatement Systems: LIC 1 PAS, LIC 2 PAS, MPF PAS, & DFS PAS
49-XXX-XXX	Agent Quantification System associated with the Bulk Drain Stations: BDS-101, & BDS-102
51-XXX-XXX	Agent Quantification Systems associated with the Rocket Shear Machines: RSM-101, & RSM-102, and the Multipurpose Demil Machines: MDM-101, MDM-102, & MDM-103

6.2.3 The following 3-4 letter codes are used to identify different types of instruments:

3-4 LETTER CODES	INSTRUMENT TYPE
XX-AIT-XXX	Analyzer Indicator Transmitters includes Continuous Emission Monitors for oxygen, carbon monoxide, & carbon dioxide, and pH analyzers
XX-DIT-XXX	Density Indicator Transmitters
XX-FIT-XXX	Flow Indicator Transmitters
XX-LIT-XXX	Level Indicator Transmitters
XX-PIT-XXX	Pressure Indicator Transmitters
XX-PDIT-XXX	Pressure Differential Indicator Transmitters

3-4 LETTER CODES	INSTRUMENT TYPE
XX-TIT-XXX	Temperature Indicator Transmitters
XX-WIT-XXX	Weight Indicator Transmitters
PAS-XXX	Chemical Agent Monitors

6.2.4 The "1-3 digit numeric suffix is used to differentiate between individual instruments of the same type.

6.2.5 Even though instruments of the same type share the same 3-4 letter "instrument type identifier" code, and some instruments share the same 1-3 digit suffix, a unique TAG ID exists for each instrument since the complete TAG ID is composed of both the 3-4 letter instrument type identifier and the 1-3 digit suffix instrument number.

6.2.6 TAG ID's describing alarm and switch waste feed interlocks are derived from the instrument TAG ID by replacing the last 2 letters in the instrument type identifier code with one of the following combinations of letters:

TAG ID	ALARM & SWITCH FEED INTERLOCK
XX-XAL-XXX	Alarm Low
XX-XALL-XXX	Alarm Low Low
XX-XDALL-XXX	Differential Alarm Low Low
XX-XSLL-XXX	Switch Low Low
XX-XAH-XXX	Alarm High
XX-XAHH-XXX	Alarm High High
XX-XDAH-XXX	Differential Alarm High
XX-XSHH-XXX	Switch High High

6.2.7 The "A" and "S" letters in the waste feed interlock TAG ID are used to differentiate between waste feed interlocks activated by switches located in the field and waste feed interlocks activated by monitored process values exceeding setpoints established in the Programmable Logic Controller (PLC) software.

6.2.7.1 "A" designates a waste feed interlock that is activated when the magnitude of the 4 to 20 milliamp control signal output from a specific transmitter exceeds a setpoint established in the PLC software. The transmitter sending the control signal causing the waste feed interlock can be determined by associating the first letter in the waste feed interlock TAG

ID with the 3 digit suffix. As an example 13-TAHH-610 (Temperature Alarm High High) is generated when the control signal output from temperature transmitter 13-TIT-610 which monitors the exhaust gas temperature of the LIC 1 primary chamber exceeds the setpoint established in the PLC software.

6.2.7.2 The instrument causing the waste feed interlock is the transmitter sending the control signal, referring to the above example, 13-TIT-610. An instrument with the TAG ID 13-TAHH-610 does not exist.

6.2.7.3 "S" designates a change in state of a switch (which can be identified in the field by the TAG ID stamped on the metal tag attached to the instrument) causes the waste feed interlock. As an example, a pressure above atmospheric in the LIC 1 primary chamber causes 13-PSHH-233 (LIC 1 Pressure Switch #233 High High) to open. When this switch is open, waste feed is stopped/prevented.

6.3 INSTRUMENT CALIBRATION & PREVENTATIVE MAINTENANCE METHODS[1]

6.3.1 Overview

6.3.1.1 Preventative maintenance performed on components of the TOCDF incinerator and tank process control systems consists of function/accuracy tests and/or re-calibration.

6.3.1.2 Preventative maintenance on user-calibrated instrumentation consists of function/accuracy tests and re-calibration if necessary.

6.3.1.3 A commercially available process instrumentation calibration system is used at the TOCDF. The calibration system allows the user to download data specific to each instrument to be calibrated. The downloaded calibrator is then taken to the field and used to input (or used to enable the input of) artificial process values into the instrument being calibrated. As the artificial process values are being input, the calibrator compares and records the instrument output. Depending on the output, the instrument is either left as is, or adjusted so that the output is within the pre-established percentage of the expected value.

6.3.1.4 The "as found" and "as left" outputs of the instrument are recorded by the calibrator. Calibration results are then downloaded from the calibrator to a database and both an electronic and hard copy record of each calibration event is maintained.

6.3.1.5 For instrumentation calibrated by the manufacturer, preventative maintenance performed by the user consists of periodic accuracy/function tests only.

6.3.1.6 The results of function tests are not recorded in the instrument calibration system database for instruments calibrated by the manufacturer. Proper calibration of manufacturer-calibrated instruments is demonstrated by the certificate of calibration

[1] In this plan, the tolerance or accuracies to which instruments are calibrated is expressed as "percent of span." Span is defined as the arithmetic difference between an instrument's lower and upper range.

provided by the manufacturer and the completed preventative maintenance procedure log sheet.

6.3.1.7 At the conclusion of each function/accuracy test (and re-calibration if necessary) the validity of the data being sent by the transmitter to the control room advisor screen is tested by a procedure referred to as a "loop check".

6.3.1.8 Loop checks are accomplished through coordination between the instrument technician performing the calibration and control room operators. The instrument technician inject various artificial control signal values into the instrument and informs the control room operator of the magnitude of the injected value. The control room operator then determines (by knowing the strength of the signal being injected and the span over which the transmitter is calibrated to) the accuracy of the entire control loop. The results of loop checks are recorded on log sheets, which are kept on file and attached to the hard copy of each function/accuracy test result and/or calibration event.

6.4 INSTRUMENT PREVENTATIVE MAINTENANCE/CALIBRATION METHODS

6.4.1 Analyzer Indicator, Transmitters (XX-AIT-XXX)

Instrumentation used to measure incinerator exhaust gas concentrations of CO and O_2, and monitor/control the pH of PAS scrubber brine solutions are referred to as analyzers.

6.4.1.1 Continuous Emission Monitoring Systems

6.4.1.1.1 The certification and calibration of hazardous waste incinerator exhaust gas CO and O_2 Continuous Emission Monitoring Systems (CEMS) are regulated by Federal Regulations found in 40 CFR 266, Appendix IX.

6.4.1.1.2 These regulations specify required methods, frequencies, and accuracies to which the CEMS must be certified, calibrated, and audited. These include daily Calibration Drift (CD) tests, quarterly Calibration Error (CE) tests, and annual performance specification tests (PSTs).

6.4.1.1.3 CO and O_2 CEMS will be managed (i.e, certified, calibrated and audited) as specified in 40 CFR 266, Appendix IX and outlined in the TOCDF CEMS Monitoring Plan (CDRL L021).

6.4.1.2 pH Analyzers

6.4.1.2.1 pH analyzers are used to control the capability of PAS scrubber solutions to absorb acid gases exhausted by the incinerators. The PAS process control system of each incinerator is equipped with two analyzers monitoring scrubber brine pH. Both analyzers sample the same location in the process stream. Only one analyzer is active at any one time. The active analyzer is used to control pH. The analyzer designated to be active is rotated at equal intervals.

6.4.1.2.2 pH analyzers are calibrated by immersing the sensing element in solutions prepared to a pH of 4, 7, and 10 and observing the pH analyzer transmitter's output. The transmitter is

determined to be properly calibrated if the output of the transmitter is within ±2.0% of the expected value. pH analyzer transmitters are calibrated at least once every 7 days.

6.4.1.2.3 As the calibration history on each pH analyzers develops, the users will be able to determine the stability of the analyzer (i.e., the tendency of the analyzer's transmitter to drift out of calibration). Should the calibration history demonstrate the stability of the transmitters associated with pH analyzers to be longer than 7 days, the calibration frequency change will be submitted as a permit modification request. The frequency of pH analyzer transmitters however will not exceed 30 days.

6.4.1.2.4 If wastes feed to an incinerator is discontinued for a period longer than 7 days, calibration of the pH analyzer/transmitter associated with the incinerator is suspended but will be done prior to the resumption of waste feed.

6.4.2 **Density Indicator, Transmitters (XX-DIT-XXX)**

6.4.2.1 The density of Pollution Abatement System scrubber brine solutions for each incinerator is measure by a vibrating tube type primary sensing element and paired transmitter.

6.4.2.2 The accuracy of the primary sensing element is established by the manufacturer through the design. The calibration of the associated transmitter is done by the manufacturer and is valid over the operational lifetime of the primary sensing element/transmitter pair. The manufacturer provides the user with a certificate of calibration for each density primary sensing element/transmitter pair. The user programs the transmitter per manufacturer instructions.

6.4.2.3 The function and accuracy of the sensing element/transmitter pair is checked by taking a sample of the scrubber brine and determining the samples density by weighing the sample or using a hydrometer.

6.4.2.4 If the density of the sample is within ±1.0% of the value reported by the sensing element/transmitter pair, the instrument is determined to be functioning properly.

6.4.2.5 Proper operation of each density primary sensing element/transmitter pair is tested at least once every 180 days.

6.4.3 **Flow Indicator, Transmitters (XX-FIT-XXX)**

Flow rates of incinerator liquid waste feeds, incinerator PAS solutions, and incinerator exhaust gases are determined using mass flow meters, magnetic flow meters, and differential pressure sensors respectively.

6.4.3.1 Mass Flow Meters

6.4.3.1.1 Mass Flow Meters are used to measure the feed rate of chemical agent and spent decontamination solution to the primary and secondary chambers of the Liquid Incinerators. Each mass flow meter consists of a vibrating tube type primary sensing element and a transmitter, which are calibrated by the manufacturer. Mass flow meters are not calibrated by the user; rather the manufacturer provides the user with a certificate of calibration for each flow meter. The manufacturer calibration is valid over the life of

the instrument. The accuracy to which the manufacturer calibrates mass flow meters to is ±0.4% of the flow rate.

6.4.3.1.2 The TOCDF uses two mass flow meters in series to measure the feed rate of chemical agent to the primary chamber of each Liquid Incinerator. This ensures accurate measurements of agent feed rates and the ability to determine proper operation of the mass flow meters. If the agent feed rates reported by each flow meter are within 5% of each other, the flow meters are determined to be functioning properly. If the flow rate values from each flow meter differ by greater than 5%, the flow meter causing the error will be repaired or replaced with a new factory calibrated one. The mass flow meter causing the error is determined by physical inspection and/or component continuity checks as described in literature provided by the manufacturer.

6.4.3.1.3 Since mass flow meters are calibrated by the manufacturer, preventative maintenance performed by the user is limited to checking the "zero value" of each flowmeter (i.e., at flow rates of 0.0 lbs/hr transmitter output should be 4.0 milliamps) and resetting the "zero value" if necessary. The "zero value" of each mass flow meter is checked at least once every 180 days.

6.4.3.2 Magnetic Flow Meters

6.4.3.2.1 Magnetic Flow Meters are comprised of a primary sensing element and a transmitter. The primary sensing element is located in a section of piping of known cross sectional area. The accuracy of the primary sensing element is established by the manufacturer through the design.

6.4.3.2.2 The transmitter associated with each magnetic flow meter is calibrated by the user. A frequency generator integrated within the transmitter as part of the flow meter's self-diagnostic system simulates the flow of liquids through the meter. Frequencies equivalent to 0 and 100 percent of span are injected into the transmitter and the resulting milliamp output of the transmitter is evaluated and adjusted if necessary.

6.4.3.2.3 Magnetic flow meter transmitters are determined to be properly calibrated if the output of the transmitter is the expected value ±1.0% of the transmitter's span. Magnetic flow meters are calibrated at least once every 180 days.

6.4.4 **Differential Pressure Indicator, Transmitters (XX-PDIT-XXX)**

6.4.4.1 Differential pressure measurements are used to determine flow rates of exhaust gases through each incinerator. A differential pressure measurement requires a transmitter capable of receiving and measuring the difference between a low and a high-pressure input.

6.4.4.2 Differential pressure indicating transmitters are calibrated by removing the low and high-pressure inputs to the transmitters. The low-pressure leg of the transmitter is then exposed to atmospheric pressure. The high-pressure leg of the transmitter is exposed to 5 successive increasing pressures using either a hand pump or compressed gas.

6.4.4.3 The transmitter is determined to be properly calibrated if the 4 to 20 milliamp output of the transmitter (when exposed to each of the five successive pressures) is the expected

value ±1.0% of the transmitter's span. Differential pressure transmitters are calibrated at least once every 360 days.

6.4.5 **Level Indicator, Transmitters (XX-LIT-XXX)**

Levels of liquids stored in permitted hazardous waste tanks and small vessels associated with the Agent Quantification System are determined using either differential pressure transmitters or ultrasonic level sensors.

6.4.5.1 Differential Pressure Transmitters

6.4.5.1.1 Differential pressure transmitters are designated in the TAG ID alpha code with the letters LIT when used in liquid level measurement applications. The low-pressure leg of the transmitter is exposed to atmospheric pressure, while the high-pressure leg is exposed to the pressure head created by the column of liquid stored in the tank.

6.4.5.1.2 Differential pressure transmitters used in tank liquid level applications are calibrated in the same manner and at the same frequency as those used to determine incinerator exhaust gas flow rates (i.e., XX-PDIT-XXX).

6.4.5.2 Ultrasonic and Radar Level Transmitters

6.4.5.2.1 Ultrasonic level sensors determine the distance between the liquid level surface and the face of the level sensor by measuring the time required for a sound pulse sent out from the sensor to be reflected off the liquid surface and return to the sensor. Radar level indicators make this same measurement using a radio frequency pulse.

6.4.5.2.2 The function/accuracy of ultra sonic level detector is tested using features included in the sensor/transmitter pair. The sensor generates artificial inputs to the transmitter at a frequency equivalent that which the transmitter would receive if the tank were empty. The sensor then repeats the process, generating inputs to the transmitter at a frequency equivalent to that which the transmitter would receive if the tank were full.

6.4.5.2.3 The output from the transmitter should be 4 and 20 milliamps respectively ±2.0% of the transmitter's span. Ultrasonic and radar transmitters are calibrated at least once every 180 days.

6.4.6 **Level Switches (XX-LSHH-XXX)**

Sonic level switches are used in permitted tank HWMU control systems to prevent the tanks from being filled beyond their capacities. Level switches are function checked to ensure proper operation by removing the switch and immersing it in liquid. The function of each level switch is tested at least once every 360 days.

6.4.7 **Temperature Indicator, Transmitters (XX-TIT-XXX)**

6.4.7.1 Temperature transmitters are calibrated using a hand held calibrations instrument, which simulates the thermocouple millivolt, output that is input to the transmitter by the thermocouple.[2] Millivolt values equivalent to 0, 25, 50, 75, and 100 percent of span are injected into the transmitter and the resulting milliamp output is evaluated.

6.4.7.2 The transmitter is determined to be properly calibrated if the 4 to 20 milliamp output of the transmitter is the expected value ±1.0% of the instrument's span. Temperature transmitters are calibrated at least once every 90 days.

6.4.8 **Current Switches (XX-TSLL-XXX)**

6.4.8.1 Current switches are used in some temperature control loops to activate waste feed interlocks. The current switch is placed in series after the temperature transmitter. The current switch is adjusted so that it opens/closes at a threshold milliamp value (i.e., the setpoint). Current switch are calibrated using a hand-held calibrator, which simulates the input normally provided by a temperature transmitter.

6.4.8.2 Each current switch is determined to be in calibration when it activates at a milliamp value equivalent to the setpoint ±1.0% instrument's span. Current switch are calibrated at least once every 360 days.

6.4.9 **Temperature Switches (XX-TSHH-XXX)**

6.4.9.1 Filled-system-type temperature switches are used on each incinerator to stop or prevent waste feed if an incinerator's PAS quench tower exhaust gas temperature exceeds the limit established through RCRA Permit conditions. Filled-system-type temperature switches are calibrated by exposing the sensing element of the switch in a region of known temperature.

6.4.9.2 Each temperature switch is determined to be properly calibrated if the switch activates at temperatures equivalent to the setpoint ±1.0% of the transmitter's span. Filled-system-type temperature switches are calibrated at least once every 360 days.

6.4.10 **Pressure Indicator, Transmitters (XX-PIT-XXX)**

6.4.10.1 Diaphragm type pressure sensors are used to measure and/or control process operating parameters associated with each incinerator's primary chamber pressure, quench brine delivery pressure to venturi scrubbers, and clean liquor delivery pressure to scrubber tower spray bars.

6.4.10.2 The transmitter associated with diaphragm type pressure sensors are calibrated using a hand air pump or compressed gas to pressurize the diaphragm. The diaphragm is

[2] Thermocouples are not calibrated. The accuracy of a thermocouple over a specific temperature range is determined by the materials of construction and design.

subjected to five different pressures ranging from 0 to 100% of the pressures the transmitter is set to span. The resulting output of the transmitter is then evaluated.

6.4.10.3 Pressure transmitters are determined to be properly calibrated if the transmitter's 4 to 20 milliamp output is the expected value ±1.0% of the instrument's span. Pressure transmitters are calibrated at least once every 180 days.

6.4.11 **Pressure Switches (XX-PSHH-XXX)**

6.4.11.1 Pressure Switches are used to stop or prevent waste feed to each incinerator when primary chamber pressures exceed limits imposed by TOCDF Part B Permit Conditions. Pressure switches are calibrated by injecting a pressure into the switch equivalent to the switches setpoint.

6.4.11.2 Pressure switches are determined to be properly calibrated if the switch activates at pressures equivalent to the setpoint ±1.0% of the instrument's span. Pressure switches are calibrated at least once every 180 days.

6.4.12 **Weight Indicator, (Transmitters XX-WIT-XXX)**

6.4.12.1 Load Cells are used to determine the heel of chemical agent remaining in bulk containers drained at the Bulk Drain Stations and control the feed rate of chemical agent to the Metal Parts Furnace. Load cells will be used to weigh the miscellaneous wastes to the MPF to verify that permit feed rates are not exceeded. They may also be used to quantify the amount of miscellaneous agent contaminated liquids (hydraulic fluid, fuel oil, lubricating oil, etc.) that will be transferred to the ACS tanks.

6.4.12.2 The transmitters associated with load cells convert and scale the millivolt output of the load cell to a 4 to 20 milliamp control signal. A calibrator is used to simulate the millivolt output of the load cell to the transmitter. The resulting output of the transmitter is then evaluated. Load cell transmitters are determined to be properly calibrated if the output of the transmitter resulting from a known input is that which is expected ±2.0% of the instrument's span. Transmitters associated with load cell are calibrated at least once every 360 days.

6.4.12.3. A scale in the TMA may also be used to quantify the amount of miscellaneous agent contaminated liquids (hydraulic fluid, fuel oil, lubricating oil, etc.) that will be transferred to the ACS tanks. This scale will be calibrated once every 360 days by placing a known weight on the scale and adjusting the scale as necessary to obtain an accuracy of ±2% of the scales range. A record of this yearly calibration date, with results, shall be kept at the facility until the next calibration has been completed.

6.4.13 **Chemical Agent Monitors**

6.4.13.1 Automatic Continuous Air Monitoring Systems (ACAMS) are used to detect concentration of agent in incinerator exhaust gases.

6.4.13.2 The calibration of ACAMS is referred to as an agent challenge. A dilute solution containing a known concentration of chemical agent is injected into the ACAMS sample port. The detection capabilities of ACAMS being tested are then evaluated. An ACAMS

is determined to be functioning properly if the anticipated agent spike appearing on the strip chart provided with each ACAMS has the correct height and width.

6.4.13.3 For a detailed description of the management of ACAMS, see Attachment 3, and 18, and 22 (Agent Monitoring Plan).

6.5 40 CFR 264.347(c) INCINERATOR WASTE FEED INTERLOCK FUNCTION TEST

6.5.1 The process control system of each incinerator is designed to stop or prevent waste feed when operating parameters exceed the limits specified in the TOCDF Part B Permit. This feature of the control system is referred to as the automatic waste feed cut off (or waste feed interlock) system. Federal and state regulations require owners and operators of incinerator HWMU to periodically test this system.

6.5.2 The TOCDF procedure titled "Waste Feed Interlock Testing" (Document Number TE-SOP-301) specifies the interlock that must be tested, the methods used to test the interlocks, and the frequencies at which the tests are to be conducted. The procedure includes the forms used to document the test results.[3]

6.5.3 The waste feed interlocks are tested using one of two methods: (1) an automated method using PLC software that allows inputs of simulated signals into the logic of the field PLCs; or (2) a manual method that is used as a backup if the automated method is not functional. The Permittee shall document in the operating record the reason(s) why the automated method was not used and the action(s) taken to correct any problems with the automated method. Waste shall not be fed to the effected furnace(s) during the waste feed interlock test. The manual backup method for testing the waste feed interlocks is as follows:

6.5.3.1 Waste feed interlocks are either activated when the 4 to 20-milliamp-control signal output from a transmitter exceeds a setpoint residing in the process control software or when the value of a process parameter exceeds the setpoint of a switch and causes the switch to open.

6.5.3.2 For waste feed interlocks activated when the magnitude of operating parameters cause the analog value of the 4 to 20 milliamp control signal output from a transmitter to exceed a setpoint residing in the process control software, the instrument technician injects an artificial control signal into the process control system that is greater or less than the value equivalent to the setpoint. The artificial control signal is injected at the location where the transmitter's output leads connect to the programmable logic controller.

6.5.3.3 For waste feed interlocks activated by a change in state of a switch (i.e., contacts closed to contacts open), the instrument technician will cause a change in state of the control loop associated with the interlock being tested by opening (or removing) the fuse to the loop.[4]

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[3] The procedure to test the overtop protection systems associated with Tank HWMU as required by 40 CFR 264.195(a) is also included in this procedure.

[4] The Level Switch High High (LSHH), which when activated, prevents continued liquid feed to tank HWMU are

6.5.3.4 For both the automated and manual methods, the ACAMS associated with the waste feed interlocks are tested by injecting a sample into the ACAMS that causes the ACAMS to alarm at the alarm setpoint. Each ACAMS is tested for a malfunction alarm. The ACAMS associated with the common stack are additionally tested for a “non-staggered” alarm.

6.5.4 The automated testing method produces a report documenting the testing of the waste feed interlocks that is prepared using a feature included with the waste feed interlock function test software. The alarms associated with the interlock function test shall be observed and verified by the Control Room Operator of the effected furnace. The observed time of each interlock alarm shall be included with the report. When using the manual backup testing methods, the control room operator observes the activation of each waste feed interlock on the incinerator specific “RCRA Alarm Summary Screen” and records the time of its activation.

6.5.4.1 The reports of the interlock function tests and alarm verifications for each furnace system and tank system shall be included in the operating record.

6.5.4.2 The interlock function test report shall verify that all appropriate interlocks occur (e.g., the common stack ACAMS alarm causes an interlock to automatically prevent the waste feed to all of the furnaces.)

6.5.5 Proper function of the entire waste feed interlock system is demonstrated considering:

- The proper operation of instrumentation causing waste feed interlocks is ensured and demonstrated by compliance with the calibration methods and frequencies established in the calibration plan,
- Successful completion of the waste feed interlock function test demonstrates the absence of "hardwire and/or software jumpers" within the portion of the process control logic (i.e., software) that stops and prevents waste feed.
- Successful completion of the waste feed interlock function test demonstrates the proper function of the PLC, the PLC code associated with stopping or preventing waste feed, and the values of the setpoints used to stop or prevent waste feed.
- The design of the control system includes continual control loop self-diagnostic checks. The process control system components are designed to fail safe (e.g., a failed thermocouple causes the associated transmitter to ramp to its high range, which in turn activates a waste feed interlock.)

6.5.6 The waste feed interlocks required to be tested are those associated with operating parameters which have a corresponding Part B Permit Condition limitation, specifically those identified in the following tables under the column heading "Waste Feed Interlock Alarm/Switch (range) TAG ID".

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tested the same way as incinerator waste feed interlocks that are activated by switches.

6.5.7 The frequency at which the testing of the waste feed interlock system of each incinerator is at least once every 14days.

6.5.8 The frequency at which the testing of the overtop protection system of each tank HWMU is at least once every 14 days.

6.5.9 Although minor modifications to the procedure may occur, portions of the procedure that will not be changed without prior approval by the Utah Division of Solid and Hazardous Waste are:

- The methods used to test waste feed interlocks.
- The interlocks required to be tested.
- The frequency at which the function test occur which is specified as every 14 days.

6.6 PROCESS DATA INSTRUMENTATION CALIBRATION & WASTE FEED INTERLOCK TABLES

6.6.1 The following tables list (by incinerator and tank HWMU) the TAG ID's of process instrumentation whose proper function is required to demonstrate compliance with permit conditions and stop or prevent waste feed when operating parameters exceed the limits established through RCRA Permit Conditions.

6.6.2 Under the column heading "Process Data Instrument TAG ID", transmitters are referenced rather than control loops because it is the transmitters that physically exists as instruments. It is the transmitters that must be calibrated properly to ensure precise process control and accurate data generation.

6.6.3 Process data generated from the output of these transmitters is electronically recorded by the Process Data Acquisition & Recording System (PDARS). The outputs of the transmitters listed is continuously monitored by the Programmable Logic Controllers (PLC), however process variables residing in the registers of the PLC are recorded by PDARS every 36 seconds.

6.6.4 The activation and duration of waste feed interlocks (listed in the following tables by alarm/switch TAG ID's) is recorded by PDARS also.

6.6.5 PDARS reports are formatted to present the hourly maximum and minimum values of each parameter listed.

6.6.6 The tables for all incinerators list two scrubber brine pH analyzer transmitter TAG ID's (A and B). The value appearing on the PDARS report associated with each incinerator is the "process variable" (a value that exists in a register of the controller which is the actual pH of the scrubber brine that is compared by the controller to the setpoint). Each scrubber brine pH analyzer is a complete separate system. Only one of the pH analyzer system is active at any one time and the system that is active is rotated on equal time intervals. It is the active system that provides the process variable to the controller and it is the process variable that appears on the PDARS reports.

6.6.7 Each exhaust gas carbon monoxide (CO) 60 minute rolling average is composed of the previous 60 one minute averages. Each one-minute average is composed of four instantaneous CO readings taken 15 seconds apart.

6.6.8 Table 6-C includes two-control loop temperature TAG ID's appearing in bold print. Controller algorithms manipulate the output of both transmitters to determine the process variable as follows:

- The controller averages the output of both transmitters if the transmitter outputs differ by less than 32°F.
- The controller uses the transmitter with the highest output if the transmitter outputs differ by greater than 32°F and the associated waste feed interlock is activated when the temperature becomes greater than the setpoint value.
- The controller uses the transmitter with the lowest output if the transmitter outputs differ by greater than 32°F and the associated waste feed interlock is activated when the temperature becomes less than the setpoint value.
- The controller uses the transmitter with the lowest output if the transmitter outputs differ by greater than 32°F and the high transmitter's output is at full scale (i.e. 20 milliamps, or maximum instrument range).

Table 6-A-1
Liquid Incinerator 1
Process Data Instrumentation Calibration/Waste Feed Interlocks

Parameter	Process Data Instrument TAG ID (range)	Waste Feed Interlock Alarm/Switch (range) TAG ID	Waste Feed Interlock Setpoint	Calibration Accuracy	Calibration/ Preventative Maintenance Frequency	Calibration/ Preventative Maintenance Method
Primary chamber exhaust gas temp. (2200°F < Temp < 2850°F)	13-TIT-610 (212 - 3000°F)	13-TAHH-610 13-TSLL-610 (4 - 20 ma)	2850°F 2550°F	±1.0% span ±1.0% span	180 days 360 days	6.4.7 6.4.8
Primary Chamber Waste Feed Rate GB ≤ 875 lbs/hr VX ≤ 580 lbs/hr H ≤ 1,160 lbs/hr HD ≤ 1,160 lbs/hr HT ≤ 1,160 lbs/hr) see NOTE 1 below	13-FIT-127A (0 - 1500 lbs/hr) 13-FIT-127B (0 - 1500 lbs/hr)	13-FAHH-127A 13-FAHH-127B	2 minute total greater than 110% permit limit 10 minute average greater than permit limit	±0.4% of flow rate ±0.4% of flow rate	180 days 180 days	6.4.3.1 6.4.3.1
Primary Chamber Waste Atomizing Air Pressure (all feed rates: >35 psig)	13-PIT-128 (0 - 200 psig)	(35 - 75 psig)	35 psig	±1.0% span ±1.0% span	180 days 180 days	6.4.10 6.4.11
Primary Chamber Waste Nozzle Pressure (feed rates > 25 lbs/hr: ≥ 5 psig)	13-PIT-112 (0 - 25 psig)	13-PALL-112B	5 psig	±1.0% span	180 days	6.4.10
Primary Chamber Pressure (Pressure < 0.0" WC)	13-PIT-052 (-20 - 5" WC)	13-PSHH-233 (-0.5 - 0.5" WC)	-0.25" WC	±1.0% span±3.0% span	180 days180 days	6.4.106.4.11
Secondary Chamber Waste Feed Rate (feed rate < 2000 lbs/hr)	13-FIT-102 (0 - 2250 lbs/hr)	13-FAHH-102	1980 lbs/hr	±0.4% of flow rate	180 days	6.4.3.1
Secondary Chamber Waste Atomizing Air Pressure (Pressure < 47 psig)		13-PSL-058 (12 - 100 psig)	47 psig	±1.0% span	180 days	6.4.11
Secondary Chamber Slag Removal Gate open		13-ZS-367B		see NOTE 2 below		
Secondary Chamber Exhaust Gas Temperature (1850°F < Temp. < 2200°F)	13-TIT-129 (32 - 2400°F)	13-TAHH-12913-TSLL-129 (4 - 20 ma)	2200°F 1850°F	±1.0% span ±1.0% span	180 days 360 days	6.4.7 6.4.8
Secondary Chamber Exhaust Gas Velocity (ΔPressure< 0.6" WC)	13-PDIT-854 (-2 - 1.75" WC)	13-PDAH-854	0.6" WC	±1.0% span	360 days	6.4.4
Quench Tower Exhaust Gas Temperature (Temperature < 225°F)	24-TIT-397 (0 - 300°F)	24-TSHH-089 (175 – 360°F)	225°F	±1.0% span ±1.0% span	180 days 360 days	6.4.7 6.4.9
Venturi Scrubber Pressure Drop (ΔPressure > 20" WC)	24-PDIT-090 (0 - 50" WC)	24-PDALL-090	20" WC	±1.0% span	360 days	6.4.4
Venturi Scrubber Liquid Feed Rate (feed rate > 100 gpm)	24-FIT-088 (0 - 150 gpm)	24-FAL-088	100 gpm30 sec. Delay	±1.0% span	180 days	6.4.3.2

Table 6-A-1
Liquid Incinerator 1
Process Data Instrumentation Calibration/Waste Feed Interlocks

Parameter	Process Data Instrument TAG ID (range)	Waste Feed Interlock Alarm/Switch (range) TAG ID	Waste Feed Interlock Setpoint	Calibration Accuracy	Calibration/ Preventative Maintenance Frequency	Calibration/ Preventative Maintenance Method
Quench Brine Delivery Pressure (Pressure > 40 psig)	24-PIT-100 (0 - 150 psig)	24-PALL-100	40 psig	±1.0% span	180 days	6.4.10
Scrubber Tower Liquid Flow Rate (flow rate > 360 gpm)	24-FIT-112 (0 - 1000 gpm)	13-FALL-112	360 gpm	±1.0% span	180 days	6.4.3.2
Scrubber Tower Liquid Delivery Pressure (Pressure > 15 psig)	24-PIT-129 (0 - 100 psig)	24-PALL-129	15 psig	±1.0% span	180 days	6.4.10
Brine Sump (PAS blow down) Liquid pH (pH > 7.0)	24-AIT-091A (0 - 14 pH) 24-AIT-091B (0 - 14 pH)	24-AALL-091	7.0 pH	±2.0% span	7 days (min.)	6.4.1.2 6.4.1.2
Brine Sump (PAS blow down) Liquid Density (density < 1.28 SG)	24-DIT-083 (0.6- 1.40 SG)	24-DAHH-083	1.28 SG	±2.0% span	180 days	6.4.2
Exhaust Gas CO Concentration Redundant 1 of 2 (CO <100 ppm, 1 hour rolling average)	13-AIT-083 (0 - 200 ppm) (0 - 3000 ppm)	13-AAH-083	1 hour rolling average greater than 100 ppm	±3.0% span	CD: daily CE: quarterly PST: annually	6.4.1.1
Exhaust Gas CO Concentration Redundant 2 of 2 (CO <100 ppm, 1 hour rolling average)	24-AIT-078 (0 - 200 ppm) (0 - 3000 ppm)	24-AAH-078	1 hour rolling average greater than 100 ppm	±3.0% span	CD: daily CE: quarterly PST: annually	6.4.1.1
Exhaust Gas O_2 Concentration Redundant 1 of 2 (3% < O_2 Conc. < 15%)	13-AIT-229 (0 - 25% O_2)	13-AAL-229 13-AAH-229	3% O_2 15% O_2	0.5% O_2 0.5% O_2	CD: daily CE: quarterly PST: annually	6.4.1.1
Exhaust Gas O_2 Concentration Redundant 2 of 2 (3% < O_2 Conc. < 15%)	24-AIT-210 (0 - 25% O_2)	24-AAL-210 24-AAH-210	3% O_2 15% O_2	0.5% O_2 0.5% O_2	CD: daily CE: quarterly PST: annually	6.4.1.1
PAS Blower Exhaust Gas Agent Concentration (Conc.< Allowable Stack Conc.)	PAS-704V (0 - 512 ASC)	PAS-704V	0.5 ASC see NOTE 3 below	±25% actual concentration	4 hours[4]	6.4.13
Common Stack Exhaust Gas Agent Concentration (Conc.< Allowable Stack Conc.)	PAS-701 G, PAS-706V(0 - 512ASC)	PAS-701G, PAS-706V	0.2 ASC see NOTE 3 below	±25% actual concentration	4 hours[4]	6.4.13
BRA Surge Tanks Full (At High High Level) BRA-TANK-101, BRA-TANK-102, BRA-TANK-201, BRA-TANK-202		23-LSHH-002 23-LSHH-006 23-LSHH-702 23-LSHH-706	18'3" level	not applicable	360 days	6.4.6
Slag Removal System Shell Temperature		TIT-374 TIT-375 TIT-376 TIT-377	500°F	±1.0% span	180 days	6.4.7

NOTES:
1. Agent feed rates for Post Trial Burn Period are 50% of values presented.
2. Waste feed interlock activated by position switch, no calibration required.
3. Allowable Stack Concentration (ASC) for chemical agents are (mg/m^3): GB= 0.0003, H/HD/HT= 0.03, and VX= 0.0003.
4. The ACAMS shall be challenged every 4 hours.

Table 6-A-2
Liquid Incinerator 2
Process Data Instrumentation Calibration/Waste Feed Interlocks

Parameter (Permit limits)	Process Data Instrument TAG ID (range)	Waste Feed Interlock Alarm/Switch (range) TAG ID	Waste Feed Interlock Setpoint	Calibration Accuracy	Calibration/ Preventative Maintenance Frequency	Calibration/ Preventative Maintenance Method
Primary chamber exhaust gas temperature (2200°F < Temp < 2850°F)	13-TIT-710 (212 - 3000°F)	13-TAHH-710 13-TSLL-710 (4 - 20 ma)	2850°F 2550°F	±1.0% span ±1.0% span	180 days 360 days	6.4.7 6.4.8
Primary Chamber Waste Feed Rate (GB ≤ 875 lbs/hr VX ≤ 580 lbs/hr H ≤ 1,160 lbs/hr HD ≤ 1,160 lbs/hr HT ≤ 1,160 lbs/hr) see NOTE 1 below	13-FIT-731A (0 - 1500 lbs/hr) 13-FIT-731B (0 - 1500 lbs/hr)	13-FAHH-731A 13-FAHH-731B	2 minute total greater than 110% permit limit 10 minute average greater than permit limit	±0.4% of flow rate ±0.4% of flow rate	180 days 180 days	6.4.3.1 6.4.3.1
Primary Chamber Atomizing Air Pressure (all feed rates: > 35 psig)	13-PIT-736 (0 - 200 psig)	13-PSLL-737C (35 - 75 psig)	35 psig	±1.0% span ±1.0% span	180 days 180 days	6.4.10 6.4.11
Primary Chamber Waste Nozzle Pressure (feed rates > 25 lbs/hr: ≥ 5 psig)	13-PIT-760 (0 - 25 psig)	13-PALL-760B	5 psig	±1.0% span	180 days	6.4.10
Primary Chamber Pressure (Pressure < 0.0" WC)	13-PIT-706 (-20 to 5" WC)	13-PSHH-845 (-0.5 - 0.5" WC)	-0.25" WC	±1.0% span ±3.0% span	180 days 180 days	6.4.10 6.4.11
Secondary Chamber Waste Feed Rate (feed rate < 2000 lbs/hr)	13-FIT-763 (0 - 2250 lbs/hr)	13-FAHH-763	1980 lbs/hr	±0.4% of flow rate	180 days	6.4.3.1
Secondary Chamber Waste Atomizing Air Pressure (Pressure < 47 psig)		13-PSL-809 (12 -100 psig)	47 psig	±1.0% span	180 days	6.4.11
Secondary Chamber Slag Removal Gate open		13-ZS-567B		see NOTE 2 below		
Secondary Chamber Exhaust Gas Temperature (1850°F < Temp. < 2200°F)	13-TIT-782 (32 - 2400°F) 13-TIT-782 (32 - 2400°F)	13-TAHH-782 13-TSLL-782 (4 - 20 ma)	2200°F1850° F	±1.0% span ±1.0% span	180 days 360 days	6.4.7 6.4.8
Secondary Chamber Exhaust Gas Velocity (ΔPressure< 0.6" WC)	13-PDIT-855 (-2 - 1.75" WC)	13-PDAH-855	0.6" WC	±1.0% span	360 days	6.4.4
Quench Tower Exhaust Gas Temperature (Temp. < 225°F)	24-TIT-816 (0 - 300°F)	24-TSHH-800 (175 - 360°F)	225°F	±1.0% span±1.0% span	180 days360 days	6.4.76.4.9
Venturi Scrubber Pressure Drop (ΔPressure > 20" WC)	24-PDIT-814 (0 - 50" WC)	24-PDALL-814	20" WC	±1.0% span	360 days	6.4.4
Venturi Scrubber Liquid Feed Rate (feed rate > 100 gpm)	24-FIT-828 (0 - 150 gpm)	24-FALL-828	100 gpm 30 sec. Delay	±1.0% span	180 days	6.4.3.2
Quench Brine Delivery Pressure (Pressure > 40 psig)	24-PIT-838 (0 - 150 psig)	24-PALL-838	40 psig	±1.0% span	180 days	6.4.10

Table 6-A-2
Liquid Incinerator 2
Process Data Instrumentation Calibration/Waste Feed Interlocks

Parameter (Permit limits)	Process Data Instrument TAG ID (range)	Waste Feed Interlock Alarm/Switch (range) TAG ID	Waste Feed Interlock Setpoint	Calibration Accuracy	Calibration/ Preventative Maintenance Frequency	Calibration/ Preventative Maintenance Method
Scrubber Tower Liquid Feed Rate (feed rate > 360 gpm)	24-FIT-825 (0 - 1000 gpm)	13-FALL-825	360 gpm	±1.0% span	180 days	6.4.3.2
Scrubber Tower Liquid Delivery Pressure (Pressure > 15 psig)	24-PIT-839 (0 - 100 psig)	24-PALL-839	15 psig	±1.0% span	180 days	6.4.10
Brine Sump (PAS blow down) Liquid pH (pH > 7.0)	24-AIT-831A (0 - 14 pH) 24-AIT-831B (0 - 14 pH)	24-AALL-831	7.0 pH	±2.0% span	7 days (min.)	6.4.1.2 6.4.1.2
Brine Sump (PAS blow down) Liquid Density (density < 1.28 SG)	24-DIT-835 (0.6 - 1.40 SG)	24-DAHH-835	1.28 SG	±2.0% span	180 days	6.4.2
Exhaust Gas CO Concentration Redundant 1 of 2 (CO <100 ppm, 1 hour rolling average)	13-AIT-778 (0 - 200 ppm) (0 - 3000 ppm)	13-AAH-778	1 hour rolling average greater than 100 ppm	±3.0% span	CD: daily CE: quarterly PST: annually	6.4.1.1
Exhaust Gas CO Concentration Redundant 2 of 2 (CO <100 ppm, 1 hour rolling average)	24-AIT-716 (0 - 200 ppm) (0 - 3000 ppm)	24-AAH-716	1 hour rolling average greater than 100 ppm	±3.0% span	CD: daily CE: quarterly PST: annually	6.4.1.1
Exhaust Gas O_2 Concentration Redundant 1 of 2 (3% < O_2 Conc. < 15%)	13-AIT-798 (0 - 25% O_2)	13-AAL-798 13-AAH-798	3% O_2 15% O_2	0.5% O_2 0.5% O_2	CD: daily CE: quarterly PST: annually	6.4.1.1
Exhaust Gas O_2 Concentration Redundant 2 of 2 (3% < O_2 Conc. < 15%)	24-AIT-717 (0 - 25% O_2)	24-AAL-71724-AAH-717	3% O_2 15% O_2	0.5% O_2 0.5% O_2	CD: daily CE: quarterly PST: annually	6.4.1.1
PAS Blower Exhaust Gas Agent Concentration (Conc.< Allowable Stack Conc.)	PAS-705V (0 - 512 ASC)	PAS-705V	0.5 ASC see NOTE 3 below	±25% actual concentration	4 hours[4]	6.4.13
Common Stack Exhaust Gas Agent Concentration (Conc.< Allowable Stack Conc.)	PAS-701G PAS –706V (0 - 512 ASC)	PAS-701G, PAS-706V	0.2 ASC see NOTE 3 below	±25% actual concentration	4 hours[4]	6.4.13
BRA Surge Tanks Full (At High High Level) BRA-TANK-101, BRA-TANK-102, BRA-TANK-201, BRA-TANK-202		23-LSHH-002 23-LSHH-006 23-LSHH-702 23-LSHH-706	18'3" level	not applicable	360 days	6.4.6
Slag Removal System Shell Temperature		TIT-574 TIT-575 TIT-576 TIT-575	500°F	± 1.0% span	180 days	6.4.7

Table 6-A-2
Liquid Incinerator 2
Process Data Instrumentation Calibration/Waste Feed Interlocks

Parameter (Permit limits)	Process Data Instrument TAG ID (range)	Waste Feed Interlock Alarm/Switch (range) TAG ID	Waste Feed Interlock Setpoint	Calibration Accuracy	Calibration/ Preventative Maintenance Frequency	Calibration/ Preventative Maintenance Method

NOTES:

1. Agent feed rates for Post Trial Burn Period are 50% of values presented.
2. Waste feed interlock activated by position switch, no calibration required.
3. Allowable Stack Concentration (ASC) for chemical agents are (mg/m^3): GB= 0.0003, H/HD/HT= 0.03, and VX= 0.0003
4. The ACAMS is shall be challenged every 4 hours.

Table 6-B
Metal Parts Furnace
Process Data Instrumentation Calibration/Waste Feed Interlocks

Parameter (Permit limits)	Process Data Instrument TAG ID (Range)	Waste Feed Interlock Alarm/Switch (Range) TAG ID	Waste Feed Interlock Setpoint	Calibration Accuracy	Calibration/ Preventative Maintenance Frequency	Calibration/ Preventative Maintenance Method
Primary Chamber Temperature zone 1 (1150°F < Temp < 1800°F)	14-TIT-152 14-TIT-391 (0 - 2000°F)	14-TAHH-152 14-TALL-152	1800°F 1150°F	±1.0% span ±1.0% span	180 days 180 days	6.4.7 6.4.7
Primary Chamber Temperature zone 2 (1150°F < Temp < 1800°F)	14-TIT-141 14-TIT-392 (0 - 2000°F)	14-TAHH-141 14-TALL-141	1800°F 1150°F	±1.0% span ±1.0% span	180 days 180 days	6.4.7 6.4.7
Primary Chamber Temperature zone 3 (1150°F < Temp < 1800°F)	14-TIT-153 14-TIT-393 (0 - 2000°F)	14-TAHH-153 14-TALL-153	1800°F 1150°F	±1.0% span ±1.0% span	180 days 180 days	6.4.7 6.4.7
Primary Chamber Waste Feed Rate Load Cells: BDS-101 Load Cells: BDS-102 Agent Quantification: MDM-101 Agent Quantification: MDM-102 Agent Quantification: MDM-103 see NOTE 1 below	 49-WIT-152 (0 - 10000 lbs) 49-WIT-252 (0 - 10000 lbs) 51-LIT-073 (0 - 30" WC) 51-LIT-083 (0 - 30" WC) 51-LIT-093 (0 - 15" WC)	 see NOTE 2 below see NOTE 2 below see NOTE 2 below see NOTE 2 below see NOTE 2 below		 ±2.0% span ±2.0% span ±1.0% span ±1.0% span ±1.0% span	 360 days 360 days 360 days 360 days 360 days	 6.4.12 6.4.12 6.4.5.1 6.4.5.1 6.4.5.1
Primary Chamber Pressure (Pressure < 0.0" WC)	14-PIT-070 (-10 - 0.0" WC)	14-PSHH-034 (-0.5 - 0.5" WC)	-0.1" WC 5 sec. Delay	±1.0% span ±1.0% span	180 days 180 days	6.4.10 6.4.11
Secondary Chamber Exhaust Gas Temp (1600°F < Temp. < 2400°F)	14-TIT-087 14-TIT-065 14-TIT-069 (0 - 2300°F)	14-TAHH-065 14-TALL-065	2175°F 1600°F	±1.0% span ±1.0% span	180 days 180 days	6.4.7 6.4.7
Duct between Primary and Secondary Chambers	14-TIT-010	N/A	N/A	±1.0% span	180 days	6.4.7
Secondary Chamber Exhaust Gas Velocity (ΔPressure< 1.2" WC)	14-PDIT-786 (0 - 2.0" WC)	14-PDAH-786	1.2" WC	±1.0% span	360 days	6.4.4
Quench Tower Exhaust Gas Temperature (Temp. < 225°F)	24-TIT-509 (0 - 300°F)	24-TSHH-223(175 - 360°F)	225°F	±1.0% span ±1.0% span	180 days 360 days	6.4.7 6.4.9
Venturi Scrubber Pressure Drop (ΔPressure > 20" WC)	24-PDIT-222 (0 - 50" WC)	24-PDALL-222	20" WC	±1.0% span	360 days	6.4.4

Table 6-B
Metal Parts Furnace
Process Data Instrumentation Calibration/Waste Feed Interlocks

Parameter (Permit limits)	Process Data Instrument TAG ID (Range)	Waste Feed Interlock Alarm/Switch (Range) TAG ID	Waste Feed Interlock Setpoint	Calibration Accuracy	Calibration/ Preventative Maintenance Frequency	Calibration/ Preventative Maintenance Method
Venturi Scrubber Liquid Feed Rate (feed rate > 100 gpm)	24-FIT-218 (0 - 150 gpm)	24-FAL-218	50 gpm	±1.0% of span	180 days	6.4.3.2
Quench Brine Delivery Pressure (Pressure > 40 psig)	24-PIT-233 (0 - 150 psig)	24-PALL-233	40 psig	±1.0% span	180 days	6.4.10
Scrubber Tower Liquid Feed Rate (feed rate > 350 gpm)	24-FIT-248 (0 - 1000 gpm)	13-FALL-248	350 gpm	±1.0% span	180 days	6.4.3.3
Scrubber Tower Liquid Delivery Pressure (Pressure > 15 psig)	24-PIT-258 (0 - 100 psig)	24-PALL-258	15 psig	±1.0% span	180 days	6.4.10
Brine Sump (PAS blow down) Liquid pH (pH > 7.0)	24-AIT-224A (0 - 14 pH) 24-AIT-224B (0 - 14 pH)	24-AALL-224	7.0 pH	±2.0% span	7 days (min.)	6.4.12 6.4.1.2
Brine Sump (PAS blow down) Liquid Density (density < 1.28 SG)	24-DIT-216(0.6 - 1.40 SG)	24-DAHH-216	1.28 SG	±2.0% span	180 days	6.4.2
Exhaust Gas CO Concentration Redundant 1 of 2 (CO <100 ppm, 1 hour rolling average)	14-AIT-384 (0 - 200 ppm) (0 - 3000 ppm)	14-AAH-384	1 hour rolling average greater than 100 ppm	±3.0% span	CD: daily CE: quarterly PST: annually	6.4.1.1
Exhaust Gas CO Concentration Redundant 2 of 2 (CO <100 ppm, 1 hour rolling average)	24-AIT-669 (0 - 200 ppm) (0 - 3000 ppm)	24-AAH-669	1 hour rolling average greater than 100 ppm	±3.0% span	CD: daily CE: quarterly PST: annually	6.4.1.1
Exhaust Gas O_2 Concentration Redundant 1 of 2 (3% < O_2 Conc. < 15%)	14-AIT-082 (0 - 25% O_2)	14-AAL-08214-AAH-082	3% $O_2$15% O_2	0.5% O_2	CD: daily CE: quarterly PST: annually	6.4.1.1
Exhaust Gas O_2 Concentration Redundant 2 of 2 (3% < O_2 Conc. < 15%)	24-AIT-670 (0 - 25% O_2)	24-AAL-67024-AAH-670	3% $O_2$15% O_2	0.5% O_2	CD: daily CE: quarterly PST: annually	6.4.11
PAS Blower Exhaust Gas Agent Concentration (Conc.< Allowable Stack Conc.)	PAS-703G PAS-703V (0 - 512 ASC)	PAS-703G, PAS-703V	0.2 ASC GB 0.5 ASC VX see NOTE 3 below	±25% actual concentration	24 hours/ 4 hours[4]	6.4.13
Common Stack Exhaust Gas Agent Concentration (Conc.< Allowable Stack Conc.)	PAS-701 (GB), PAS-706 (VX) (0 - 512 ASC)	PAS-701G, PAS-706V	0.2 ASC see NOTE 3 below	±25% actual concentration	4 hours[4]	

Table 6-B
Metal Parts Furnace
Process Data Instrumentation Calibration/Waste Feed Interlocks

Parameter (Permit limits)	Process Data Instrument TAG ID (Range)	Waste Feed Interlock Alarm/Switch (Range) TAG ID	Waste Feed Interlock Setpoint	Calibration Accuracy	Calibration/ Preventative Maintenance Frequency	Calibration/ Preventative Maintenance Method
BRA Surge Tanks Full (at High High Level)			18'3" level	not applicable	360 days	6.4.6
BRA-TANK-101,		23-LSHH-002				
BRA-TANK-102,		23-LSHH-006				
BRA-TANK-201,		23-LSHH-702				
BRA-TANK-202		23-LSHH-706				

NOTES:

1. Agent/Item feed rates specified in Permit Conditions V.B.3. and VI.B.3.a.
2. Load cell/level indicator transmitters associated with Agent Quantification System (AQS), which measure agent drained from item. No waste feed interlock associated with the AQS, rather the feed rate drained items adjusted based on agent heal remaining.
3. Allowable Stack Concentration (ASC) for chemical agents are (mg/m^3): GB= 0.0003, H/HD/HT= 0.03, and VX= 0.0003
4. The VX duct ACAMS shall be challenged every 4 hours. The GB duct ACAMS shall be challenged every 24 hours, plus or minus 30 minutes.

Table 6-C
Deactivation Furnace System
Process Data Instrumentation Calibration/Waste Feed Interlocks

Parameter (permit limits)	Process Data Instrument TAG ID (Range)	Waste Feed Interlock Alarm/Switch (Range) TAG ID	Waste Feed Interlock Setpoint	Calibration Accuracy	Calibration Frequency	Calibration Method
Primary Chamber Waste Feed Rate (M55 Rockets: GB ≤ 20.3 lbs/hrM55 Rockets: VX ≤ 19.0 lbs/hrM25 Mines: VX ≤ 36.8 lbs/hr) Rocket Shear Machine 101Rocket Shear Machine 102 see NOTE 1 below	51-LIT-051 51-LIT-057 (0 - 30" WC)	see NOTE 2below		±1.0% span	360 days	6.4.5.1
Kiln Pre Quench Exhaust Gas Temperature (950°F < Temp)	16-TIT-182 16-TIT-244 (0-2300°F)	16-TALL-182	950°F	±1.0% span	180 days	6.4.7
Kiln Rotational Speed (0.0 rpm < rotation ≤ 2.0 rpm)	Calculated from 16-ZX-602	16-SAHH-602 16-SALL-602	2.00 rpm 0.33 rpm	see note 3 below		
Primary Chamber Pressure (Pressure < 0.0" WC)	16-PIT-018 (-2 - 1.0" WC)	16-PSHH-204 (-0.5 - 0.5" WC)	-0.1" WC	±1.0% span ±3.0% span	180 days 360 days	6.4.10 6.4.11
Kiln Post Quench Exhaust Gas Temperature (850°F ≤ Temp≤ 1650°F)	16-TIT-008 16-TIT-169 (0 - 2300°F)	16-TALL-008 16-TAHH-008	850°F 1650°F	±1.0% span	180 days	6.4.7
Heated Discharge Conveyor Temperature, Bottom (≥ 1000°F)	16-TIT-042 (0 -1600°F)	16-TALL-042	1000°F	±1.0% span	180 days	6.4.7
Heated Discharge Conveyor Temperature, Top (≥ 1000°F)	16-TIT-184 (0 -1600°F)	16-TALL-184	1000°F	±1.0% span	180 days	6.4.7
Equipment Protection Feed Chute Jammed: Line A Feed Chute Jammed: Line B Discharge Chute Jammed: Heated Discharge Conveyor No Motion:		16-XS-207 16-XS-209 16-XS-05816-XS-821 16-SSL-057	see NOTE 3 below			
Afterburner Exhaust Gas Temperature (2050°F < Temp. < 2400°F)	16-TIT-092 (0 - 2400°F) 16-TIT-003 (0 - 2400°F)	16-TAHH-092 16-TALL-092	2350°F 2050°F	±1.0% span ±1.0% span	180 days 180 days	6.4.7 6.4.7
Afterburner Exhaust Gas Velocity (ΔPressure< 0.95" WC)	16-PDIT-813 (0 - 3.0" WC)	16-PDAH-813	0.93" WC	±1.0% span	360 days	6.4.4

Table 6-C
Deactivation Furnace System
Process Data Instrumentation Calibration/Waste Feed Interlocks

Parameter (permit limits)	Process Data Instrument TAG ID (Range)	Waste Feed Interlock Alarm/Switch (Range) TAG ID	Waste Feed Interlock Setpoint	Calibration Accuracy	Calibration Frequency	Calibration Method
Quench Tower Exhaust Gas Temperature (Temperature < 225°F)	24-TIT-374 (0 - 300°F)	24-TSHH-001 (175 - 360°F)	225°F	±1.0% span ±1.0% span	180 days 360 days	6.4.7 6.4.9
Venturi Scrubber Pressure Drop (ΔPressure > 20" WC)	24-PDIT-008 (0 - 50" WC)	24-PDALL-008	20" WC	±1.0% span	360 days	6.4.4
Venturi Scrubber Liquid Flow Rate (flow rate > 300 gpm)	24-FIT-006 (0 - 400 gpm)	24-FAL-006	300 gpm 30 sec. Delay	±1.0% span	180 days	6.4.3.2
Quench Brine Delivery Pressure (Pressure > 40 psig)	24-PIT-011 (0 - 200 psig)	24-PALL-011	40 psig	±1.0% span	180 days	6.4.10
Scrubber Tower Liquid Flow Rate (flow rate > 360 gpm)	24-FIT-030 (0 - 3000 gpm)	13-FALL-030	360 gpm	±1.0% span	180 days	6.4.3.2
Scrubber Tower Liquid Delivery Pressure (Pressure > 15 psig)	24-PIT-036 (0 - 100 psig)	24-PALL-036	15 psig	±1.0% span	180 days	6.4.10
Brine Sump (PAS blow down) Liquid pH (pH > 7.0)	24-AIT-007A (0 - 14 pH) 24-AIT-007B (0 - 14 pH)	24-AALL-007	7.0 pH	±2.0% span	7 days (min.)	6.4.1.2 6.4.1.2
Brine Sump (PAS blow down) Liquid Density (density < 1.28 SG)	24-DIT-033 (0.6 - 1.40 SG)	24-DAHH-033	1.28 SG	±2.0% span	180 days	6.4.2
Exhaust Gas CO Concentration Redundant 1 of 2 (CO <100 ppm, 1 hour rolling average)	16-AIT-059 (0 - 200 ppm) (0 - 3000 ppm)	16-AAH-059	1 hour rolling average greater than 100 ppm	±3.0% span	CD: daily CE: quarterly PST: annually	6.4.1.1
Exhaust Gas CO Concentration Redundant 2 of 2 (CO <100 ppm, 1 hour rolling average)	24-AIT-207 (0 - 200 ppm) (0 - 3000 ppm)	24-AAH-207	1 hour rolling average greater than 100 ppm	±3.0% span	CD: daily CE: quarterly PST: annually	6.4.1.1
Exhaust Gas O_2 Concentration Redundant 1 of 2 (3% < O_2 Conc. < 15%)	16-AIT-175 (0 - 25% O_2)	16-AAL-175 16-AAH-175	3% O_2 15% O_2	0.5% O_2	CD: daily CE: quarterly PST: annually	6.4.1.1
Exhaust Gas O_2 Concentration Redundant 2 of 2 (3% < O_2 Conc. < 15%)	24-AIT-206 (0 - 25% O_2)	24-AAL-206 24-AAH-206	3% O_2 15% O_2	0.5% O_2	CD: daily CE: quarterly PST: annually	6.4.1.1
PAS Blower Exhaust Gas Agent Concentration (Conc.< Allowable Stack Conc.)	PAS-702 G PAS-702V (0 - 512 ASC)	PAS-702G, PAS-702V	0.2 ASC GB 0.5 ASC VX see NOTE 4 below	±25% actual concentration	24 hours/ 4 hours[5]	6.4.13

Table 6-C
Deactivation Furnace System
Process Data Instrumentation Calibration/Waste Feed Interlocks

Parameter (permit limits)	Process Data Instrument TAG ID (Range)	Waste Feed Interlock Alarm/Switch (Range) TAG ID	Waste Feed Interlock Setpoint	Calibration Accuracy	Calibration Frequency	Calibration Method
Common Stack Exhaust Gas Agent Concentration (Conc.< Allowable Stack Conc.)	PAS-701 (GB), PAS-706 (VX) (0 - 512 ASC)	PAS-701G, PAS-706V	0.2 ASC see NOTE 4 below	±25% actual concentration	4 hours[5]	6.4.13
BRA Surge Tanks Full (at High High level) BRA-TANK-101, BRA-TANK-102, BRA-TANK-201, BRA-TANK-202		 23-LSHH-002 23-LSHH-006 23-LSHH-702 23-LSHH-706	18'3" level	not applicable	360 days	6.4.6

NOTES:

1. Agent/Item feed rates specified in Permit Conditions V.C.3. and VI.C.3.a. Agent feed rates for Post Trial Burn Period are 50% of values presented.
2. Level indicator transmitters associated with Agent Quantification System (AQS) which measure agent drained from item. No waste feed interlock associated with the AQS, rather the feed rate of drained items is adjusted based on agent heal remaining.
3. Waste feed interlock activated by proximity switch or speed switch. These items are not calibrated. Proper function is based on proper orientation of the switch to the item being sensed.
4. Allowable Stack Concentration (ASC) for chemical agents are (mg/m^3): GB= 0.0003, H/HD/HT= 0.03, and VX= 0.0003
5. The VX duct ACAMS shall be challenged every 4 hours. The GB duct ACAMS shall be challenged every 24 hours, plus or minus30 minutes.

Table 6-D
Dunnage Incinerator
Process Data Instrumentation Calibration/Waste Feed Interlocks

Parameter (permit limits)	Process Data Instrument TAG ID (range)	Waste Feed Interlock Alarm/Switch (range) TAG ID	Waste Feed Interlock Setpoint	Calibration Accuracy	Calibration Frequency	Calibration Method
Primary Chamber Temperature (1300°F < Temp < 2100°F)	07-TIT-389 (0 - 2200°F)	07-TAHH-389 07-TALL-389	2100°F 1300°F	±1.0% span	180 days	6.4.7 6.4.8
Primary Chamber Pressure (Pressure < 0.0" WC)	07-PIT-039 (-6 - 0.0" WC)	07-PAHH-039 (-0.5 - 0.5" WC)	0.1" WC	±1.0% span	180 days	6.4.10
Afterburner Exhaust Gas Temperature (1800°F < Temp. < 2150°F)	07-TIT-039A (0 - 2200°F) 07-TIT-038B (0-2200°F)	07-TAHH-390 07-TALL-390	2150°F 1800°F	±1.0% span ±1.0% span	180 days 180 days	6.4.7 6.4.8
Afterburner Exhaust Gas Velocity (ΔPressure< 0.6" WC)	07-PDIT-390 (0 - 1.5" WC)	07-PDAH-390	0.6" WC	± 1.0% span	360 days	6.4.7
Exhaust Gas CO Concentration Redundant 1 of 2 (CO <100 ppm, 1 hr rolling avg)	07-AIT-254 (0 - 200 ppm) (0 - 3000 ppm)	07-AAH-254	1 hour rolling average greater than 100 ppm	±3.0% span	CD: daily CE: quarterly PST: annually	6.4.1.2
Exhaust Gas CO Concentration Redundant 2 of 2 (CO <100 ppm, 1 hr rolling avg)	24-AIT-208 (0 - 200 ppm) (0 - 3000 ppm)	24-AAH-208	1 hour rolling average greater than 100 ppm	±3.0% span	CD: daily CE: quarterly PST: annually	6.4.1.2
Exhaust Gas O_2 Concentration Redundant 1 of 2 (3% < O_2 Conc. < 15%)	07-AIT-253 (0 - 25% O_2)	07-AAL-253 07-AAH-253	3% O_2 15% O_2	0.5% O_2	CD: daily CE: quarterly PST: annually	6.4.1.2
Exhaust Gas O_2 Concentration Redundant 2 of 2 (3% < O_2 Conc. < 15%)	24-AIT-209 (0 - 25% O_2)	24-AAL-209 24-AAH-209	3% O_2 15% O_2	0.5% O_2	CD: daily CE: quarterly PST: annually	6.4.1.2
Quench Tower Exhaust Gas Temperature	24-TIT-165 (0-1000°F)	24-TAHH-165	475°F	±1.0% span	180 days	6.4.7
Baghouse Pressure Drop	24-PDIT-166 (0-11" WC)	24-PDAL-166	0.5" WC	±1.0% span	360 days	6.4.10
Stack Exhaust Gas Hcl concentration (Not a stop feed but a demonstration of compliance HCl < 4.0 lbs. per hr)	24-AIT-270	24-AAH-270				6.4.1.2
DUN Stack Exhaust Gas Agent Concentration (Conc.< Allowable Stack Conc.)	DUN201 (0 - 511 ASC)	DUN201	1.0 ASC see NOTE 1 below	±25% actual concentration	4 hours	6.4.13

NOTES:

1. Allowable Stack Concentration (ASC) for chemical agents are (mg/m^3): GB= 0.0003, H/HD/HT= 0.03, and VX= 0.0003

Table 6-E
Tank Hazardous Waste Management Unit
Process Data Instrumentation Calibration/Tank Overtop Protection Interlocks

System (Tank Designation)	Instrument TAG ID (range)	Stop Feed to Tank Interlock Switch TAG ID	Interlock Setpoint (Note 2)	Calibration Accuracy	Calibration/ Preventative Maintenance Frequency	Calibration/ Preventative Maintenance Method
Agent Collection System (ACS-TANK-101)	11-LIT-9001 (4ma = 6"20ma = 90")	11-LSHH-091	7'-6" above tangent	±1.0% span see NOTE 1 below	180 days 360 days	6.4.5.2 6.4.6
Agent Collection System (ACS-TANK-102)	11-LIT-9002 (4ma = 6"20ma = 105")	11-LSHH-111	8'-9" above tangent	±1.0% span	180 days 360 days	6.4.5.2 6.4.6
Spent Decon System (SDS-TANK-101)	11-LIT-020 (4ma = 0"20ma = 107")	11-LSHH-018	9'5" above tangent	±1.0% span	180 days 360 days	6.4.5.2. 6.4.6
Spent Decon System (SDS-TANK-102)	11-LIT-030 (4ma = 0"20ma = 107")	11-LSHH-028	9'5 "above tangent	±1.0% span	180 days 360 days	6.4.5.2 6.4.6
System Decon System (SDS-TANK-103)	11-LIT-064 (4ma = 0"20ma = 107")	11-LSHH-062	9'5 "above tangent	±1.0% span	180 days 360 days	6.4.5.2. 6.4.6
Brine Reduction Area (BRA-TANK-101)	23-LIT-003 (4ma = 0"20ma = 210")	23-LSHH-002	18'-3" above bottom	±1.0% span	360 days 360 days	6.4.5.3 6.4.6
Brine Reduction Area (BRA-TANK-102)	23-LIT-007 (4ma = 0"20ma = 210")	23-LSHH-006	18'-3" above bottom	±1.0% span	360 days 360 days	6.4.5.3 6.4.6
Brine Reduction Area (BRA-TANK-201)	23-LIT-703 (4ma = 0"20ma = 210")	23-LSHH-702	18'-3" above bottom	±1.0% span	360 days 360 days	6.4.5.3 6.4.6
Brine Reduction Area (BRA-TANK-202)	23-LIT-707 (4ma = 0"20ma = 210")	23-LSHH-706	18'-3" above bottom	±1.0% span	360 days 360 days	6.4.5.3 6.4.6

NOTES:
1. Level switches are not calibrated, they are function tested. The level at which they activate is not adjustable since each switch is positioned in the tank through a flanged opening in the side of the tank.
2. The tank tangent is the weld connection between the straight side and the bottom dome.